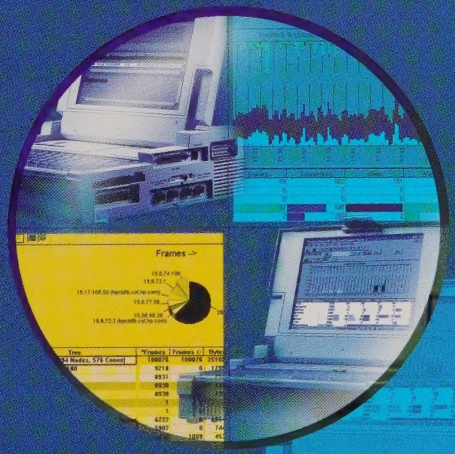
Internet Advisor



Internet Advisor LAN

Getting Started

Agilent Technologies

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Agilent Technologies

Internet Advisor LAN

Getting Started

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Introduction

Introduction

The Agilent Technologies Internet Advisor LAN is a powerful protocol analyzer designed to help you troubleshoot and analyze your Ethernet, Fast Ethernet, FDDI, and Token-Ring networks.

It consists of a ruggedized personal computer equipped with modular data acquisition and transmission hardware, as well as powerful Microsoft® Windows® based network analysis software. Standard peripherals such as serial/parallel ports, floppy drive, pc card slot, etc. are also included.

You can use the Internet Advisor LAN to:

- prevent network problems before they affect users
- resolve network problems quickly and effectively
- optimize network performance

The following pages provide a more detailed overview of the features of this network test equipment.

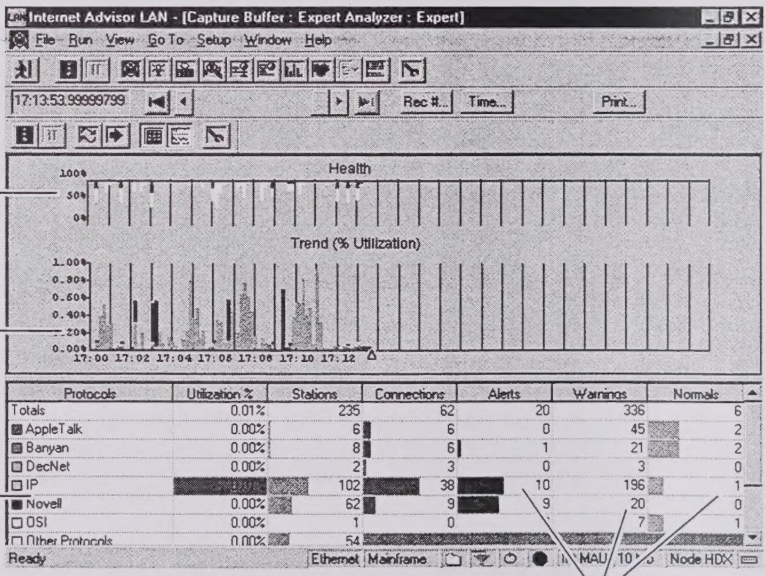
- Start with Expert Analyzer to see a quick overview of the health, utilization, and protocol activity on your network.
- Examine the physical layer to see if nodes on your network can connect and communicate.
- See who is sending the most traffic. See what protocols are they using. See which stations are establishing connections.
- Find out what network protocol errors are occurring on your network.
- Discover which nodes are on your network.

Starting with Expert Analyzer

See the health, utilization, and protocol activity at a glance

The Expert Analyzer measurement is a good way to see the performance of your network at-a-glance. The top section is a health and utilization graph. Health starts at the top of the graph at 100% and if your network is error free, it stays at 100%. When an event occurs, a value is subtracted from the health, more for alert events, less for warning everts. These values are configurable. The trend graph displays selectable parameters in a sliding 30-minute window. Each major protocol is shown in a different color on the trend graph.

Below the health and trend graph is a spreadsheet of information about your network. The rows are labeled with the active protocol stacks detected on the data source. The spreadsheet shows how much activity is occurring in each protocol. From this measurement, you can quickly drill-down to see supporting details to understand why a graph spike or a large count occurred.



The Health graph shows a weighted view of Alert and Warning protocol events and frame errors.

See a graph of network utilization.

The spreadsheet quickly identifies where the most protocol activity is occurring.

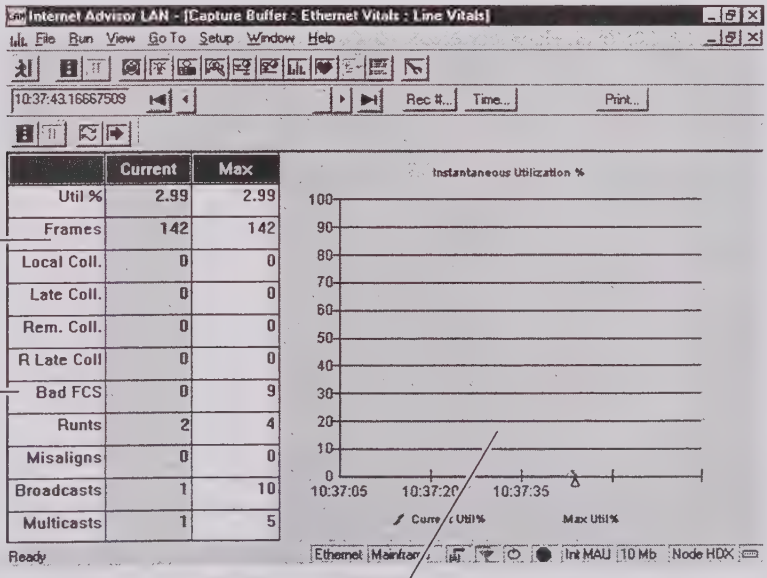
Count the Alerts, Warnings, and Normal protocol events for each protocol.

Examining Physical Layer Activity

Can stations connect and communicate?

Often, the first thing you want to know is if your network stations are even able to connect and communicate. The Ethernet Vitals measurement quickly shows you if the physical layer is operating.

Some of the Vitals counts indicate normal and desirable activity. Other counts may indicate serious and potentially damaging activity.



See if any traffic is being transmitted.

See if the frames have transmission errors.

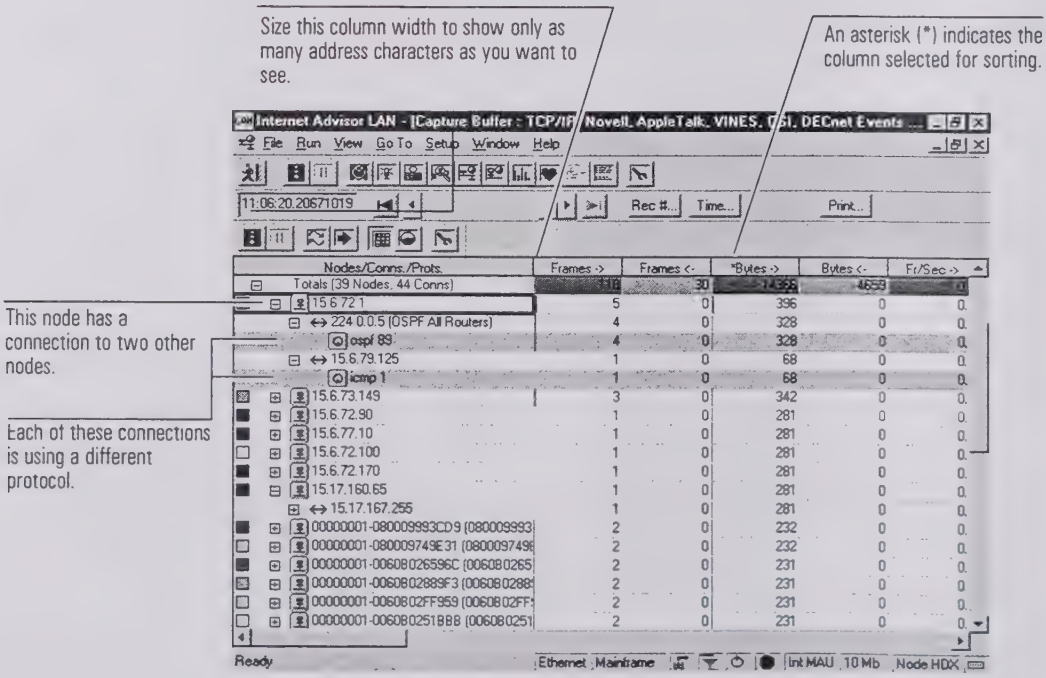
See the percentage of current and maximum network utilization over the last minute.

Examining the Top Talkers

Who is sending the most traffic? Who are they talking to? What protocol are they using?

When you are having too high utilization, or perhaps slow network response, you can quickly see who is using most of the network bandwidth. When you know who the top talkers are, you can make decisions about how to improve their network communications.

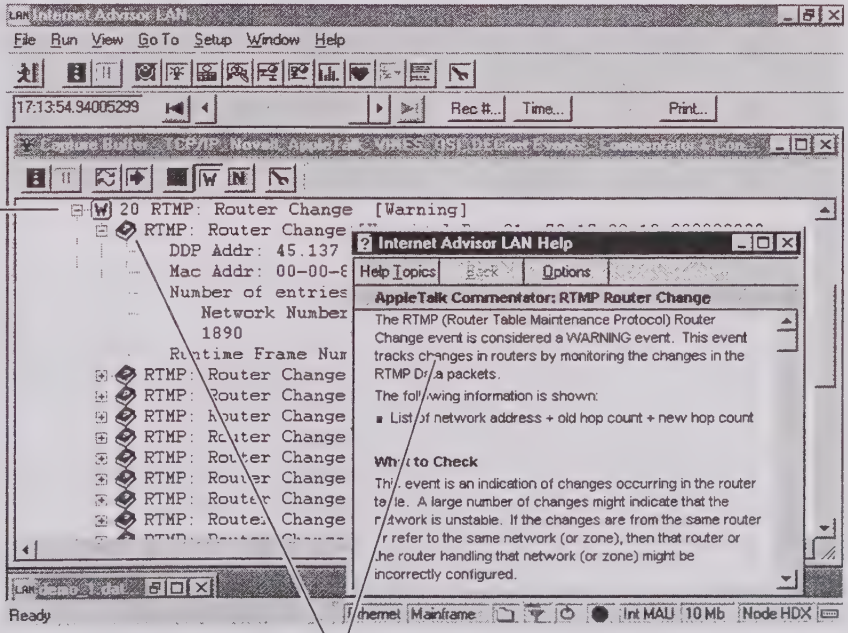
You can choose different parameters to sort. This shows you where the most traffic is occurring for different traffic conditions.



Examining Protocol Errors

What network protocol errors are occurring?

You can quickly see what protocol events are occurring and organize the events by severity.


Internet Advisor LAN
File Run View GoTo Setup Window Help
17:13:54.94005299
Rec #...
Time...
Print...
20 RTMP: Router Change [Warning]
RTMP: Router Change
DDP Addr: 45.137
Mac Addr: 00-00-8
Number of entries
Network Number
1890
Runtime Frame Num
RTMP: Router Change
Internet Advisor LAN Help
Help Topics
Back
Options
AppleTalk Commentator: RTMP Router Change
The RTMP (Router Table Maintenance Protocol) Router Change event is considered a WARNING event. This event tracks changes in routers by monitoring the changes in the RTMP Data packets.
The following information is shown:
List of network address + old hop count + new hop count
What to Check
This event is an indication of changes occurring in the router table. A large number of changes might indicate that the network is unstable. If the changes are from the same router or refer to the same network (or zone), then that router or the router handling that network (or zone) might be incorrectly configured.
Ready
Int MAU
10 Mb
Node HDX

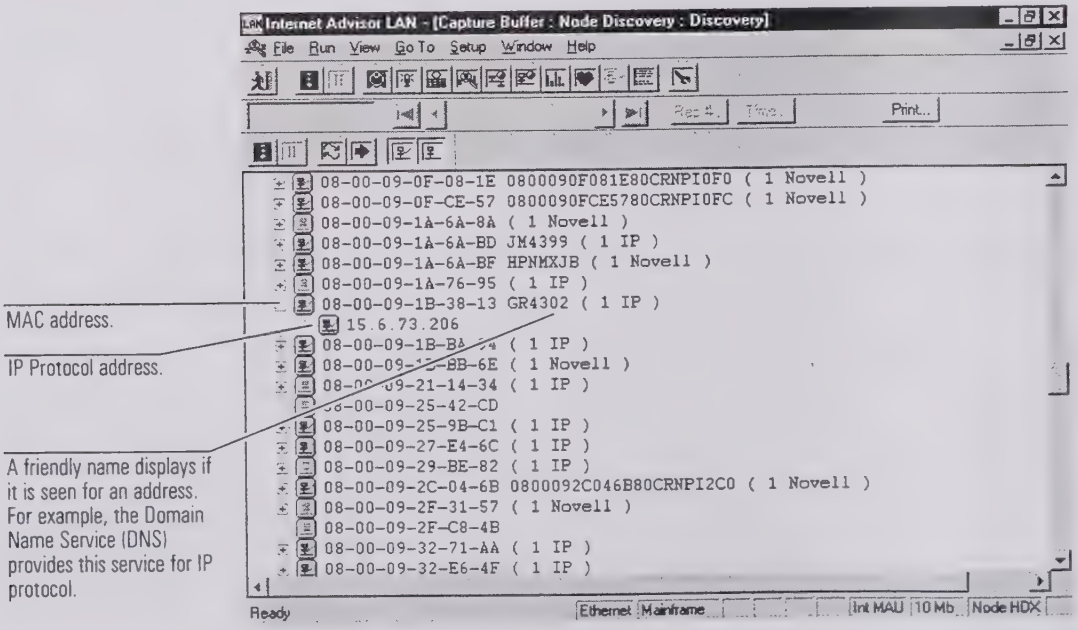
This protocol address has had 20 Router Change events occur. This is a Warning event.

Click the Book icon in the display to see detailed help about this event. Suggestions are given for possible remedies.

Discovering What Nodes Are on the Network

Are any unexpected nodes on my network?

During a measurement run, you can "discover" all the nodes on your network. You can see the nodes listed by MAC address or network layer address. You can also see a "friendly" or well-known name if it is known.


Internet Advisor LAN - [Capture Buffer : Node Discovery : Discovery]
File Run View Go To Setup Window Help
Print...
08-00-09-0F-08-1E 0800090F081E80CRNPI0F0 (1 Novell)
08-00-09-0F-CE-57 0800090FCE5780CRNPI0FC (1 Novell)
08-00-09-1A-6A-8A (1 Novell)
08-00-09-1A-6A-BD JM4399 (1 IP)
08-00-09-1A-6A-BF HPNMXJB (1 Novell)
08-00-09-1A-76-95 (1 IP)
08-00-09-1B-38-13 GR4302 (1 IP)
15.6.73.206
08-00-09-1B-BB-6E (1 Novell)
08-00-09-25-42-CD
08-00-09-25-9B-C1 (1 IP)
08-00-09-27-E4-6C (1 IP)
08-00-09-29-BE-82 (1 IP)
08-00-09-2C-04-6B 0800092C046B80CRNPI2C0 (1 Novell)
08-00-09-2F-31-57 (1 Novell)
08-00-09-2F-C8-4B
08-00-09-32-71-AA (1 IP)
08-00-09-32-E6-4F (1 IP)
Ready
Ethernet Mainframe
Int MAU 10 Mb Node HDX
MAC address.
IP Protocol address.
A friendly name displays if it is seen for an address. For example, the Domain Name Service (DNS) provides this service for IP protocol.

Decoding Frames on Your Network

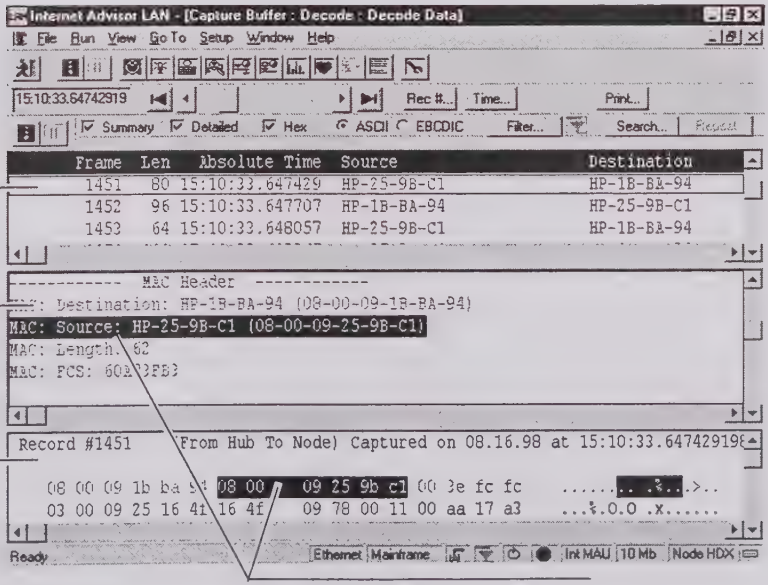
What are the actual contents of a frame on my network?

The Decode measurement interprets the data in a frame according to its protocol so you can examine the contents of the frames.

A timestamp and frame number are added to each frame to help you examine the data.

Examples of information you can determine from the Decode view include:

- Is a node on the network making requests and responses correctly?
- Do timing issues exist between frames on the network?
- Are higher levels of the protocol stack operating correctly (for example, does the Time to Live counter decrement properly)?



Summary view shows a summary line for each frame.

Detail view shows the decoded contents of each field in the selected frame.

Hex view shows the actual bytes in the selected frame. The right column shows the contents in ASCII or EBCDIC.

Click a field in the Detail view and see the corresponding bytes highlighted in the Hex view

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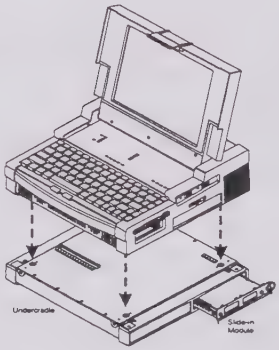
Getting Started

Getting Started

This chapter describes the steps you use to get started testing with the Internet Advisor LAN.

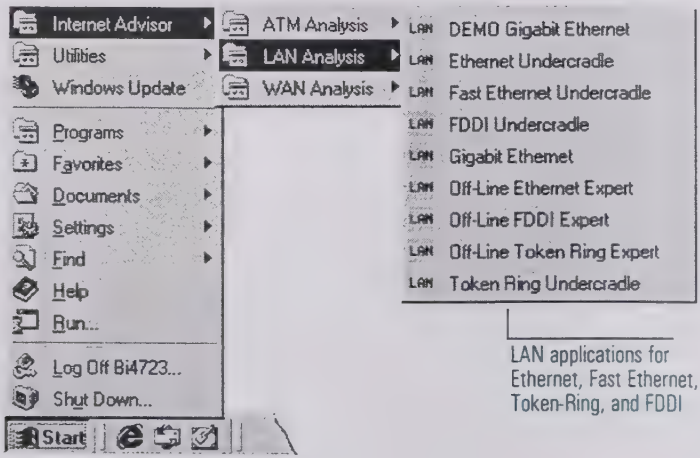
There are some steps you perform each time you start testing your network. Other steps you do only one time or just check that a step you performed previously is still valid.

① **Install the undercradle and slide-in module you are using.**
Install software if necessary.



Use the Mainframe Features Guide to connect the mainframe, undercradle, and slide-in modules.
Use the CD-ROM Software Installation Guide to install or add software.

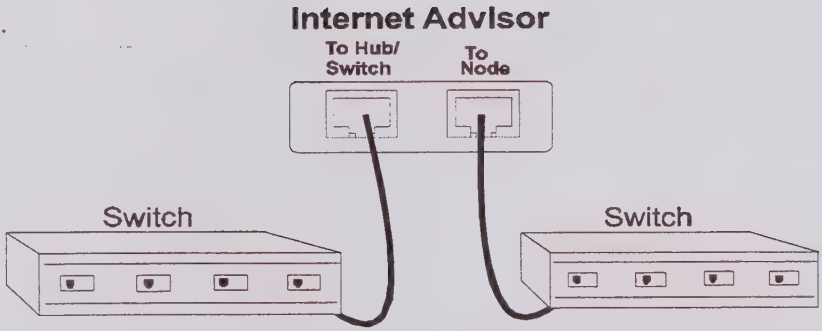
② **Start the LAN application.**
Select the mainframe or undercradle LAN product you are using.



LAN applications for Ethernet, Fast Ethernet, Token-Ring, and FDDI

③ Connect to the network.

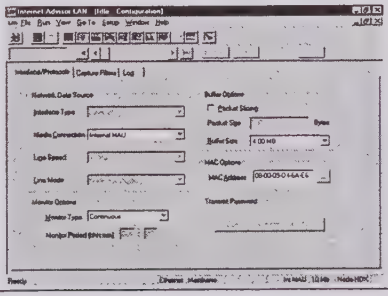
This example shows connecting the Internet Advisor between two Fast Ethernet switches in monitor-thru mode.



④ Configure the Internet Advisor instrument.

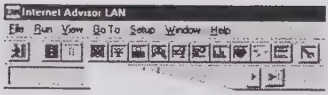
What test port are you connecting to?

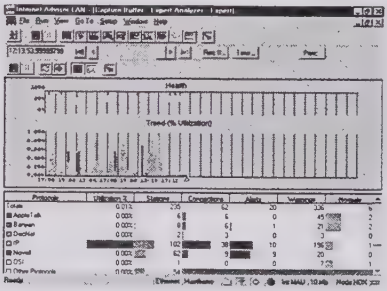
How do you want the capture buffer to operate?



(5) Select a measurement.

The Expert Analyzer measurement is a good place to start.





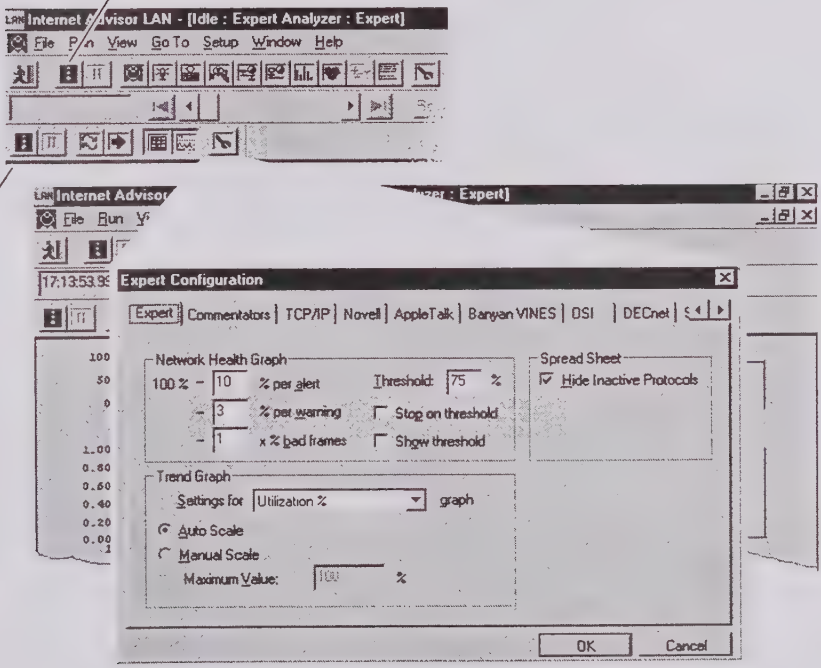
Start/Stop all open measurements.

⑥ **Configure the measurement and start the run.**

What time do you want for the sample period?

Do you want to set any thresholds?

Start/Stop selected measurement.



Installing Undercradles, Interface Modules, and Software

Undercradle and Interface Module installation

Depending on the options you have purchased, you may have to install an interface module or undercradle for the specific physical interface you intend to connect to. If these items are not already connected to your Internet Advisor, refer to the *Mainframe Features* guide for instructions.

CAUTION

Be sure the Internet Advisor power switch is set to Off before removing or installing undercradles or interface modules.

NOTE

Required Upgrade for Agilent Technologies J3444A Fast Ethernet Undercradle

Agilent Technologies J3444A-02 Upgrade for Plug & Play ROM and IO Boundary ROM

If you are using the Fast Ethernet undercradle, Agilent Technologies J3444A, you need to check if your undercradle has a BIOS upgrade before you use the undercradle with LAN.
Look for a silver label "EC:04" on the bottom of the undercradle.
The Agilent Technologies J3444A Fast Ethernet undercradle requires this upgrade to operate with the Windows Plug & Play feature.
Contact your local Agilent Technologies sales office for information.

Software Installation

The Internet Advisor is shipped with it's application software installed on the hard drive. If you are reinstalling the Internet Advisor LAN software, or adding a new application, be sure to save any measurement and configuration files you have created to a floppy disk before installing the new LAN software.

To install the Internet Advisor LAN software, first remove any attached undercradle and then use the instructions in the *Software Installation Guide* supplied with the Internet Advisor software CD.

If you are installing other application software, follow the instructions provided with that software.

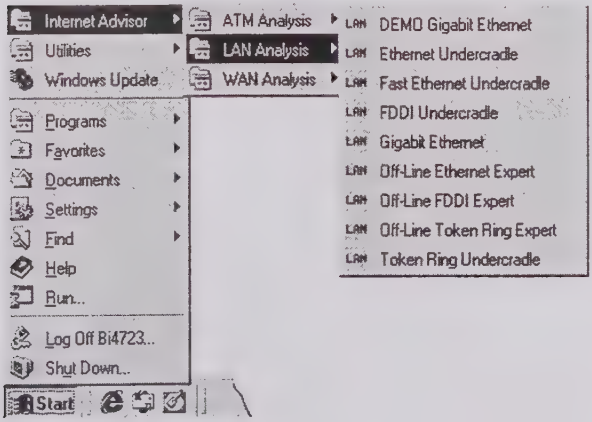
Starting the Application

Start the Internet Advisor for the first time

The first time you start the Internet Advisor with software shipped from Agilent Technologies, Microsoft requires you to provide some information to complete the configuration.

Several dialog boxes prompt you for information such as user name, company name, etc. You can accept the default selections by pressing ENTER.

A Certificate of Authenticity box prompts you for an authenticity number. Enter the Microsoft Windows authenticity product ID# affixed to the mainframe.



Connecting to an Ethernet Network

The figures on the two following pages show how to connect the Internet Advisor as a node to an Ethernet network segment or in monitor-thru mode between two network devices. See the Connect to the Network topic in the online help index for more details about connecting to the network.

Connect as a Node

When you connect the Internet Advisor as a node to a network segment, the Advisor acts as regular node on the network. The Advisor can see all the traffic occurring on that network segment.

The Advisor measurements transparently see all the traffic that occurs at the hub or switch port you are connected to. The Advisor does not affect the data stream.

Connect in Monitor-Thru Mode.

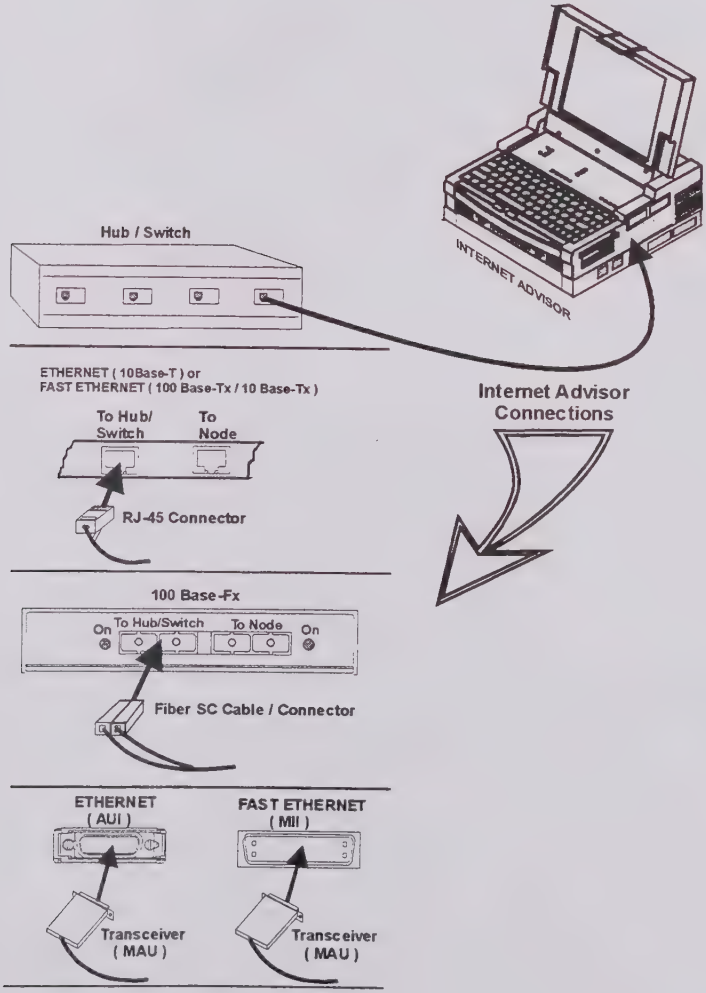
When you connect the Internet Advisor in monitor-thru mode, the Internet Advisor is inserted between two network devices. The Internet Advisor does not interact with the traffic it sees, it only passively displays the traffic that is passing between the two devices connected to it.

The following table shows what connectors you can use for monitor-thru operation with Ethernet or Fast Ethernet.

10 Mbit Operation	100 Mbit Operation (no Auto-Negotiate)
RJ-45 (10BaseT)	SC fiber connectors (monitor HDX or FDX)
RJ-45 (100BaseTx) (monitor HDX only)	RJ-45 (100BaseTX) (monitor HDX or FDX)

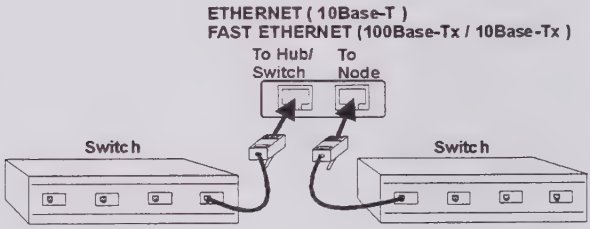
TIP: You can not monitor with TX Auto Negotiate selected as the media connection because auto negotiation can only occur between the two end devices. In this mode, the Internet Advisor is only monitoring and cannot participate in the auto negotiate process.

To Connect as a Node

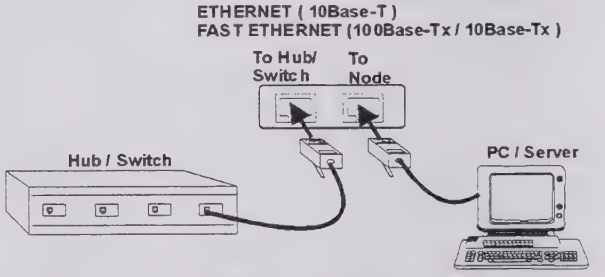


To Connect in Monitor-Thru Mode

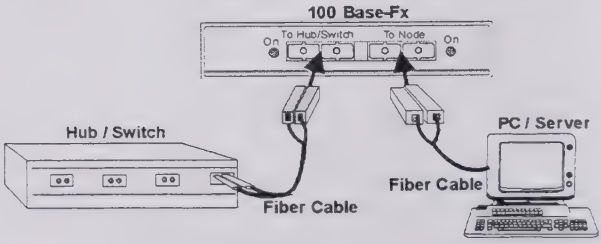
Monitoring between two switches.



Monitoring between a node and a hub/switch with RJ-45 connectors.



Monitoring between a node and a hub/switch with Fiber SC connectors.



To connect in monitor mode with a crossover cable

For switched 10/100 Ethernet, Internet Advisor does not perform crossover of transmit/received pairs internally. If this function is required (e.g. connecting two switches together) the crossover function must be done external to the Internet Advisor.

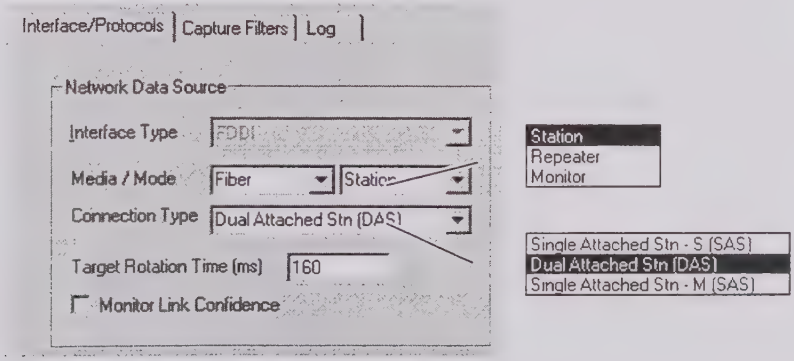
Use the cable you would use for a node to hub/switch connection as one of the cables in monitor mode and then use a straight-through cable for the other connection. The combined cable length for the two connections should not exceed 100 meters.

Connecting to an FDDI Network

The figures on the next few pages show how to connect the Internet Advisor to an FDDI network. The Advisor must successfully connect to the FDDI network before it can be an active station on the ring. In the status bar at the bottom of the display, the station configurations: DAS, SAS-S, and SAS-M indicate that the Advisor's SMT module is active in the FDDI network. See the online help for more details about connecting to the network.

Connection Types

You can connect the Advisor as a station, repeater, or monitor on an FDDI network. Use the Configure Instrument dialog to set the connection Mode and Type and then connect the Advisor to the network as shown in the next few pages.

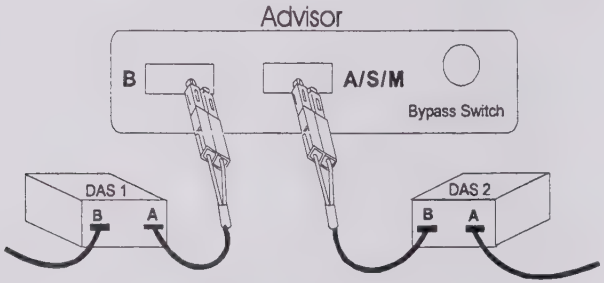


To Connect as an FDDI Station

DAS -- Dual Attach Station

The Advisor can be connected as a station in Dual Attach mode.

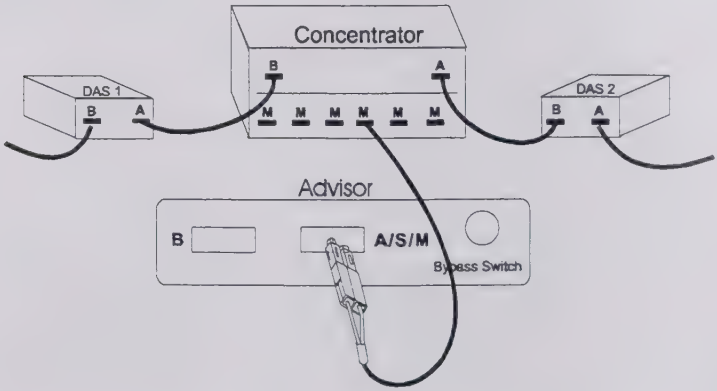
- The Advisor is attached to both the primary and secondary rings.
- The Advisor is an active station on the ring.
- Port A/S/M functions as an A port.



SAS-S -- Single Attach Station

The Advisor can be connected as a station in Single Attach mode.

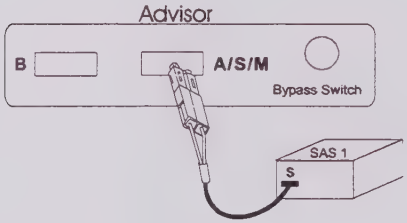
- The Advisor attaches to a concentrator's M port and is an active station on the ring.
- Port A/S/M functions as an S port.



SAS-M -- Single Attach Station

The Advisor can be connected as a station in Concentrator mode.

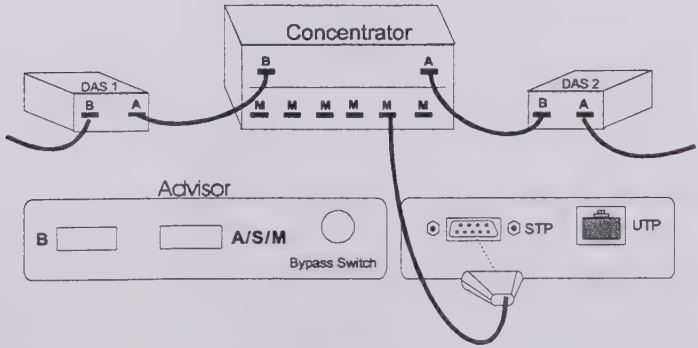
- The Advisor is acting as a concentrator.
- Port A/S/M functions as an M port and may be attached to an A, S, or B type port on another device.
- This configuration constitutes a small ring and is used to test a single attach station.



SAS-S -- Single Attach Station with Copper Twisted-Pair Cable

The Advisor can be connected as a station in Single Attach mode by using the copper twisted pair (STP) cable connection. The example below shows the shielded twisted-pair connector. You can also use the unshielded twisted-pair (UTP) cable connector.

- The Advisor attaches to a concentrator's M port and is an active station on the ring.
- Port A/S/M functions as an S port.

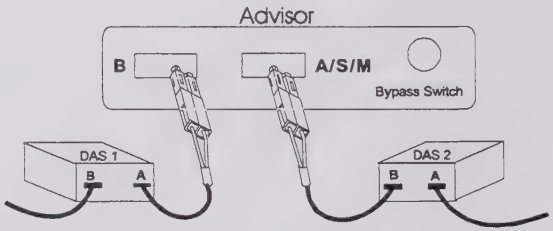


To Connect as an FDDI Repeater

DRP -- Dual Port Repeater - Primary

The Advisor can be connected in Dual Port Repeater - Primary mode.

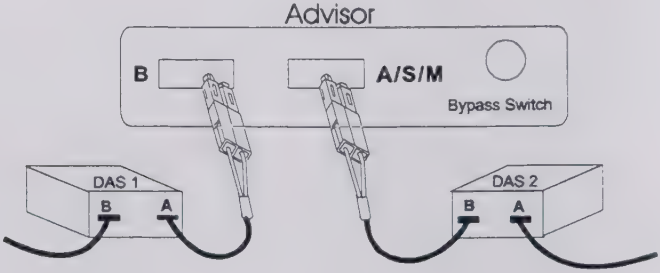
- The Advisor is attached to both the primary and secondary rings as a repeater.
- Symbols are reclocked and repeated.
- The Advisor receives and transmits on the primary ring.
- SMT is not active.
- Port A/S/M functions as an A port.



DRS -- Dual Port Repeater - Secondary

The Advisor can be connected in Dual Port Repeater - Secondary mode.

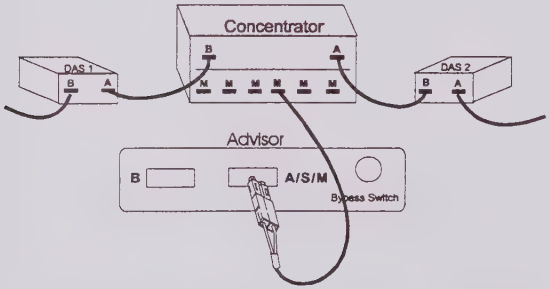
- The Advisor is attached to both the primary and secondary rings as a repeater.
- Symbols are reclocked and repeated.
- The Advisor receives and transmits on the secondary ring.
- SMT is not active.
- Port A/S/M functions as an A port.



SAR -- Single Port Repeater

The Advisor can be connected in Single Port Repeater mode.

- The Advisor is attached to the primary ring through a concentrator's M port.
- Symbols are reclocked and repeated.
- The Advisor receives and transmits on the primary ring.
- SMT is not active.
- Port A/S/M functions as an A port.

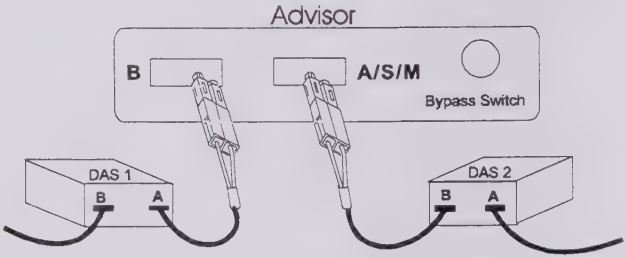


To Connect as an FDDI Monitor

DMP -- Dual Port Monitor - Primary

The Advisor can be connected in Dual Port Monitor - Primary mode.

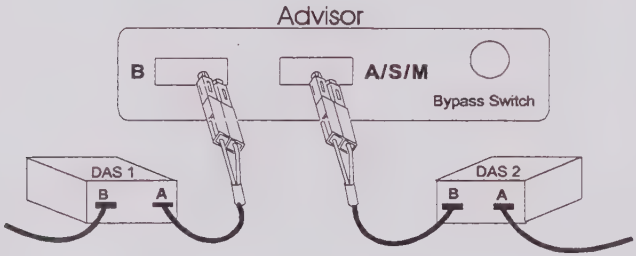
- The Advisor is attached to both the primary and secondary rings as a tap or monitor.
- The Advisor monitors the primary ring.
- Symbols are repeated but not reclocked.
- SMT is not active and Traffic Generation is disabled.
- Port A/S/M functions as an A port.



DMS -- Dual Port Monitor - Secondary

The Advisor can be connected in Dual Port Monitor - Primary mode.

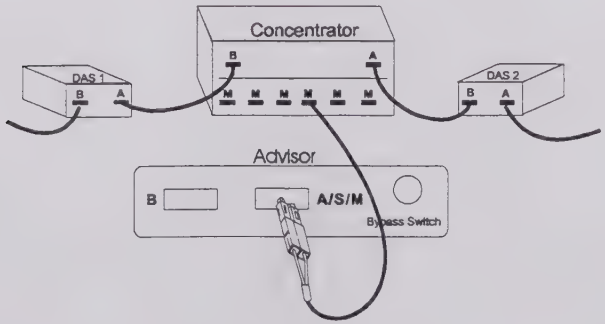
- The Advisor is attached to both the primary and secondary rings as a tap or monitor.
- The Advisor monitors the secondary ring.
- Symbols are repeated but not reclocked.
- SMT is not active and Traffic Generation is disabled.
- Port A/S/M functions as an A port.



SAM -- Single Port Monitor

The Advisor can be connected in Single Port Monitor mode.

- The Advisor is attached to the primary ringthrough a concentrator's M port as a tap or monitor.
- The Advisor monitors the primary ring.
- Symbols are repeated but not reclocked.
- SMT is not active and Traffic Generation is disabled.
- Port A/S/M functions as an S port.

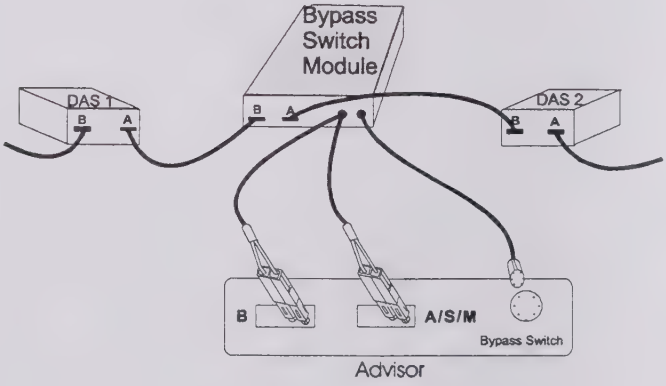


To Connect with an Optical Bypass Switch

Optical Bypass Switch Connection

You can use the Bypass Switch connector and the fiber SC connectors to connect the Advisor to a multimode fiber network. With this connection, the Advisor can operate in station, repeater, or monitor mode.

The Internet Advisor's FDDI undercradle provides an output that can be used to drive an external optical bypass switch. If power is removed from the Advisor, the resulting loss of power to the bypass switch will cause its internal switch relays to bypass the Advisor.



To Connect with an Optical Splitter

Optical Splitter Connection

You can use an optical splitter to connect the Advisor to a fiber network.

The advantage of using an optical splitter is that you can attach the Internet Advisor to the network without affecting the network. However, when you connect the Advisor to an FDDI network through an optical splitter, the Advisor can only monitor the network. The Advisor can not transmit onto the network when you use an optical splitter.

Connecting to a Token-Ring Network

This section shows how to connect the Internet Advisor as a station to a Token-Ring network. The Advisor must successfully connect to the Token-Ring network before it can be an active station on the ring. In the status bar at the bottom of the display, icons show the connection status and ring speed. See the online help for more details about connecting to the network.

To Connect as an Token-Ring Station

The Advisor can be connected as a station in either 4 or 16 MBits/second mode. This is determined by the ring speed you select when you start the Advisor.

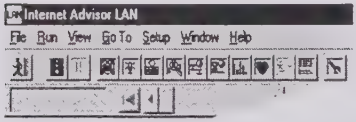
Both ring speeds use the same interface connector to connect to the network.

Configuring the Instrument

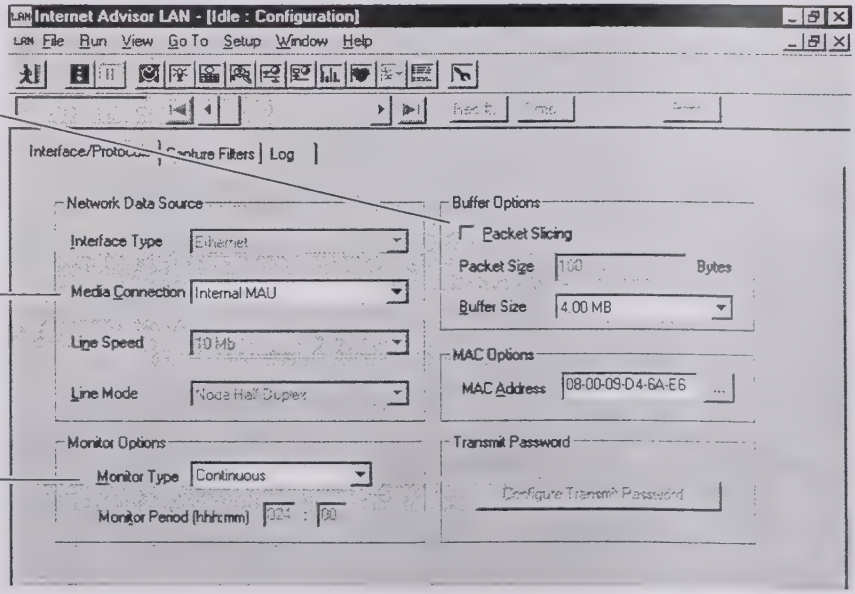
Before you run a measurement, you need to configure the Internet Advisor.

You can configure Interface/Protocols, to determine which test port you are connecting to and how you want the capture buffer to operate.

You can create Filters/Counters, to control which frames are stored in the capture buffer. And, you can Log or store measurement results over a long period of time.



To display online help for a measurement window or configure dialog, open the window or dialog and press F1.



Do you want to capture each entire frame, or only a portion of each frame?

Which test port are you connecting to?

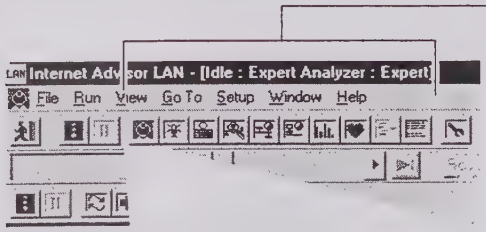
How do you want the capture buffer to operate?

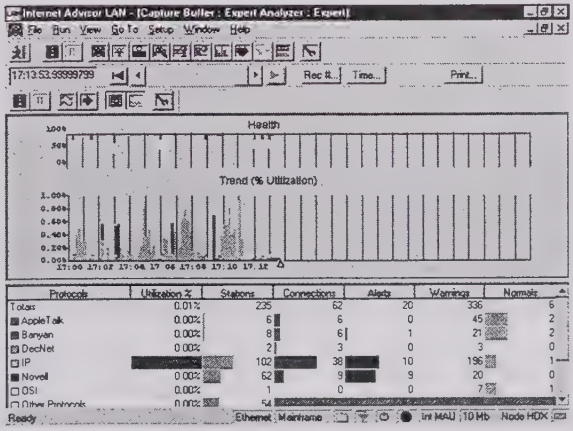
Selecting a Measurement

The Internet Advisor has several measurements that can show different parameters about how your network is operating. You can open a measurement with the buttons on the toolbar or with items in the File | Open Measurement menu.

The toolbar buttons are the quickest way to open a measurement. Position the cursor over a toolbar button to display the measurement name.

More than one measurement can be open and running at a time.


Available Measurements.
Internet Advisor LAN - [Idle : Expert Analyzer : Expert]
File Run View Go To Setup Window Help
Top level toolbar.
Toolbar for open and currently selected measurement.



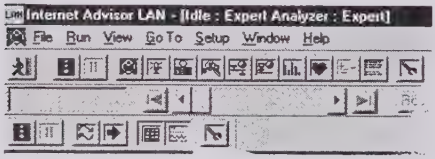
To display online help for a measurement window, open the window and press F1.

Configuring a Measurement

Before you run a measurement, you can customize the measurement by selecting parameters to control how the measurement operates.

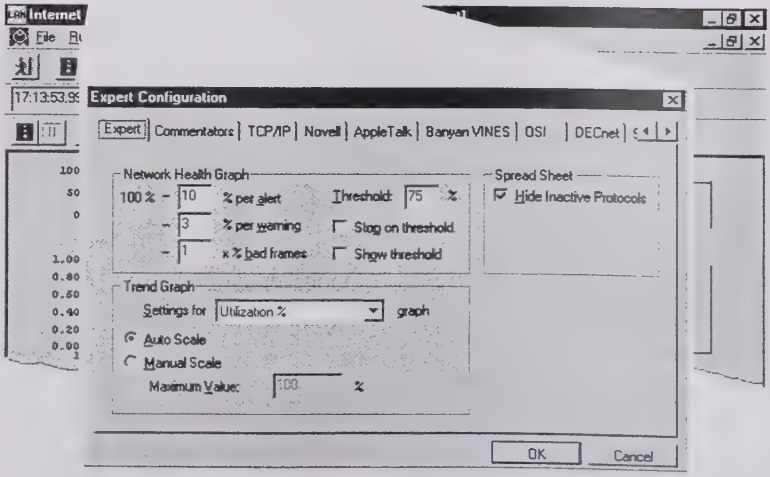
Some measurements are controlled by the Commentator measurement configuration. If the Commentator measurement is open, the measurement configure button does not display in these measurements.

What display update interval do you want to use?



Do you want to set thresholds to determine what to count?

Do you want to select which protocol messages to count or ignore?



To display online help for a measurement window or configure dialog, open the window or dialog and press F1.

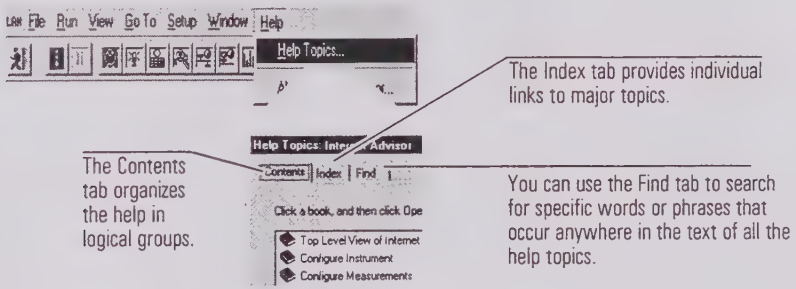
Finding More Information

LAN Online Help

Online help is built into the LAN application. You can access help from the menu bar at the top of the application window or by using the **F1** key.

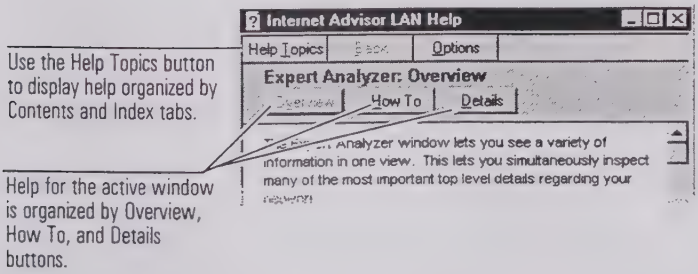
Online Help Menu

The Help menu item opens the general LAN help window so that you can choose from three different ways to find the help you want.


File Run View GoTo Setup Window Help
Help Topics...
The Index tab provides individual links to major topics.
Help Topics: Inter Advisor
Contents Index Find
Click a book, and then click Ope
Top Level View of Internet
Configure Instrument
Configure Measurements
The Contents tab organizes the help in logical groups.
You can use the Find tab to search for specific words or phrases that occur anywhere in the text of all the help topics.

Context Sensitive Online Help

You can quickly find information about the currently selected Advisor window by pressing **the** F1 key.


Internet Advisor LAN Help
Help Topics
Options
Expert Analyzer: Overview
How To
Details
Analyzer window lets you see a variety of information in one view. This lets you simultaneously inspect many of the most important top level details regarding your
Use the Help Topics button to display help organized by Contents and Index tabs.
Help for the active window is organized by Overview, How To, and Details buttons.

Sample Tests

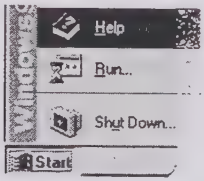
The next chapter in this book describes examples for using the Advisor to make measurements on your network.

Other Internet Advisor Books

Each of the different technologies tested with the Internet Advisor has a separate Getting Started manual. Use the appropriate Getting Started manual when you go to test another network technology.

Windows Online Help

You can find information on general Windows operation from the online Help tutorial - About Windows. If you are not familiar with the Windows 98 operating system, it is a good idea to spend a few minutes learning the basic functions and terminology associated with the Windows environment.



***Operating System Guide* manual**

The manual, *Operating System Guide*, is shipped with each Internet Advisor to help you get up and running quickly.

3

- Troubleshooting a Slow Ethernet Network, page 3-3
- Tracing a Conversation Between Two Ethernet Stations, page 3-13
- Export to CSV, page 3-20
- Import CSV Into a Spreadsheet, page 3-23

Sample Tests

Sample Tests

This chapter illustrates a sample test examples to lead you quickly through using the Internet Advisor to solve common LAN testing problems:

- Troubleshooting a slow Ethernet network
- Tracing a conversation between two Ethernet nodes (filtering)

Example file

The traffic used in some of the example tests is available in a file. You can just read the following pages, or, you can use the same data file and perform the example steps with your own Internet Advisor.

The data file for this example is included with the Internet Advisor in location:
C:\ADVISOR\LAN\DATA\DEMO_1.DAT

To learn more...

For more information about how to use the features of the Internet Advisor, refer to the online Help. You can press F1 while in the Internet Advisor LAN application to get specific information about the currently active window, measurement view, or dialog box.

Troubleshooting a Slow Ethernet Network

Your network is running slowly, you suspect someone in the office is spending too much time on the Internet. Things you may want to know include:

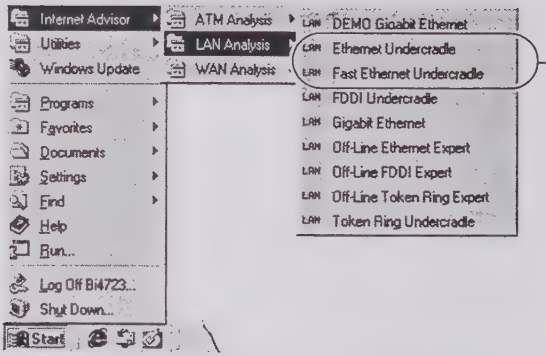
- what station address is using the Internet
- to what server is the user connecting
- how much data is being transferred
- what protocols are being used
- what errors are being generated

Example equipment and menu choices

The Internet Advisor LAN used in this example has the standard Ethernet interface. You can use this interface or you can also use a Fast Ethernet interface for Internet Advisor LAN.

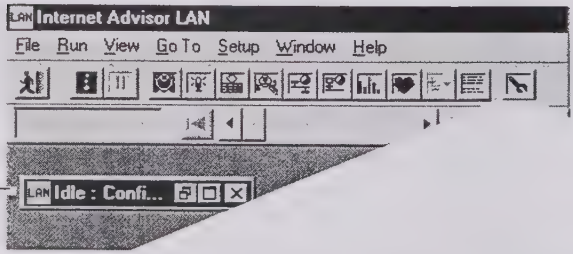
Several menu choices are made to configure the Internet Advisor for this example. These choices are usually the default selection or have been made for the easiest configuration. You can make these same choices or you can make different choices to observe how the Internet Advisor responds.

① **Start the Internet Advisor LAN application.**



The Ethernet and Fast Ethernet hardware on your Internet Advisor displays in this cascaded menu.

② **If the Configure Instrument view is not open (the view is minimized), click the Configure Instrument button on the toolbar.**



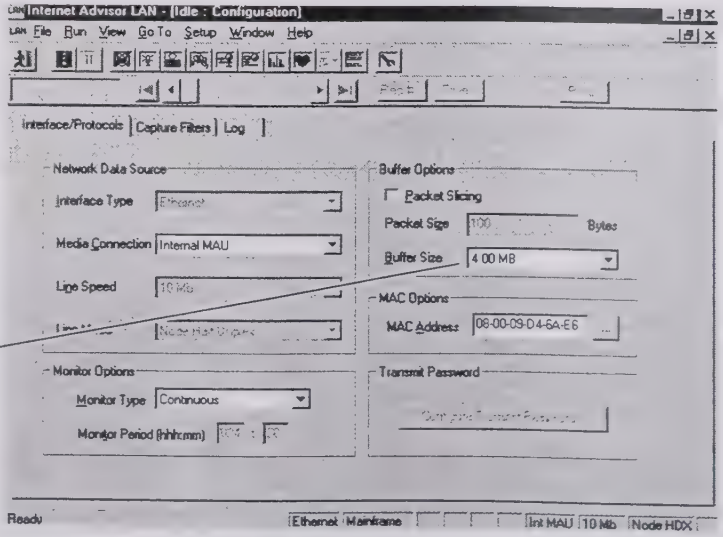
Configure Instrument view minimized.

③ **Configure the Internet Advisor.**

Since this example is running from a a data file loaded into the capture buffer, no Media Connection or Monitor Type selection is required.

For this example, let's ignore filtering and logging.

④ **Set the capture buffer size to at least 4 MBytes to display the following example's values.**



(5) If you are going to use the Demo_1.dat file and follow this example on your own Internet Advisor, load the file now.

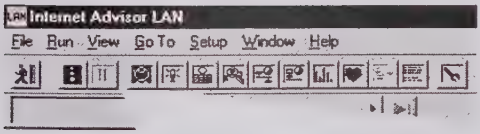
a. Use File | Open (Load Data) and the path:C:\ADVISOR\LAN\DATA\DEMO_1.DAT.

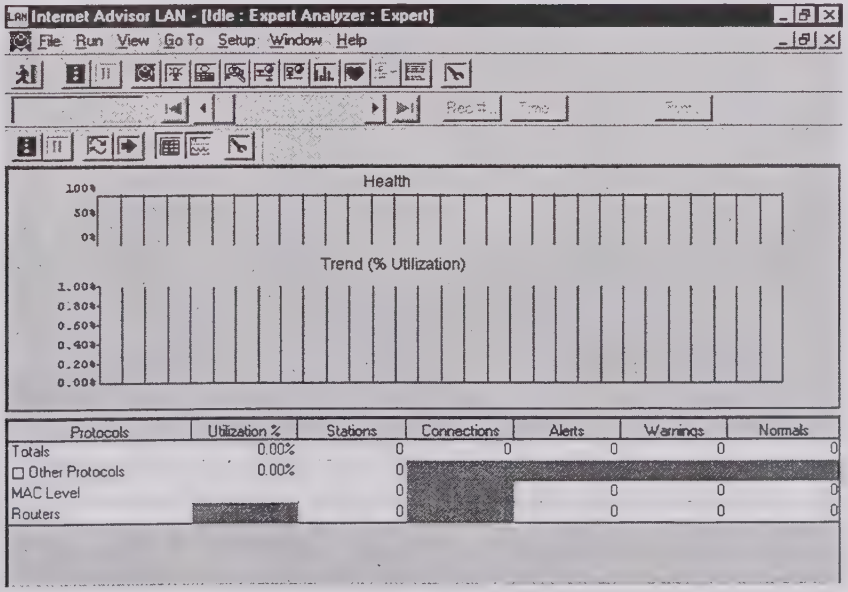
b. Click OK.

c. The Internet Advisor loads the file into the capture buffer and automatically opens the Decode measurement to display the file. This takes a few seconds, depending on the type of Internet Advisor you have.

d. Close the Decode measurement.

(6) Open the Expert Analyzer measurement.



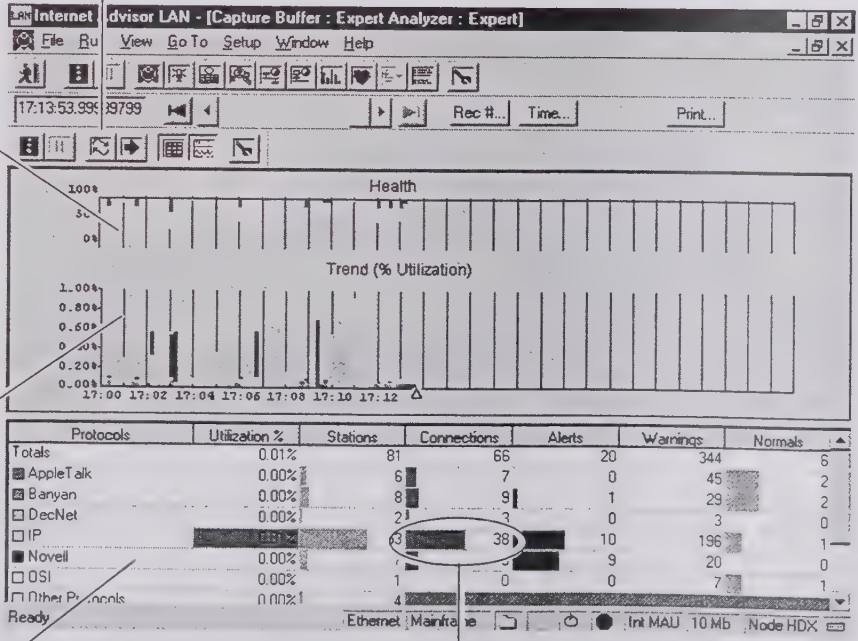


⑦ **Click the Run From Capture Button.**

At the prompt, select Run All Frames.

⑧ **Wait several minutes while the Advisor reads the capture buffer (a Run from Capture Buffer dialog closes when the buffer is processed.)**
Notice there are many IP Connections (Internet traffic uses IP connections) and a large number of IP Warnings

The Expert Analyzer shows three types of information:



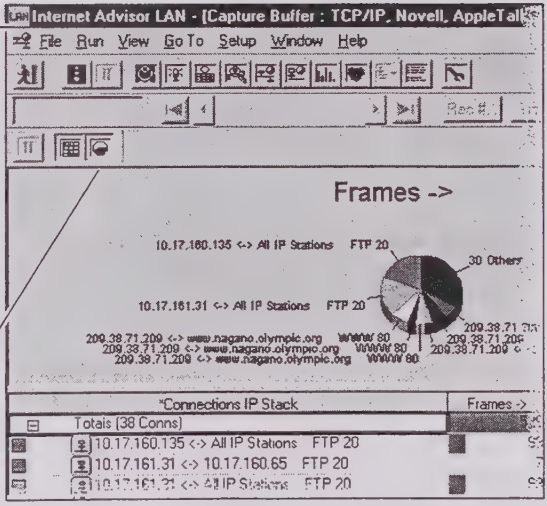
Health -- shows quality of Alarm, Warning, and DLL frame events. When you see yellow or red on this graph, it means the Commentator and Vital measurements will have more information about what the problem is.

Trends -- shows history of network utilization as a default measurement. Click the right mouse button to display frame counts, errors, broadcasts, or other counts in this graph.

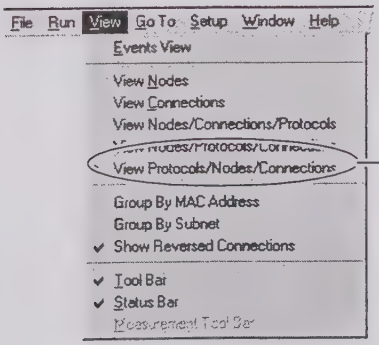
Spreadsheet -- shows summary counts for several network indicators.

⑨ **Double click the IP / Connections cell to display more details about the connections for the IP protocol.**

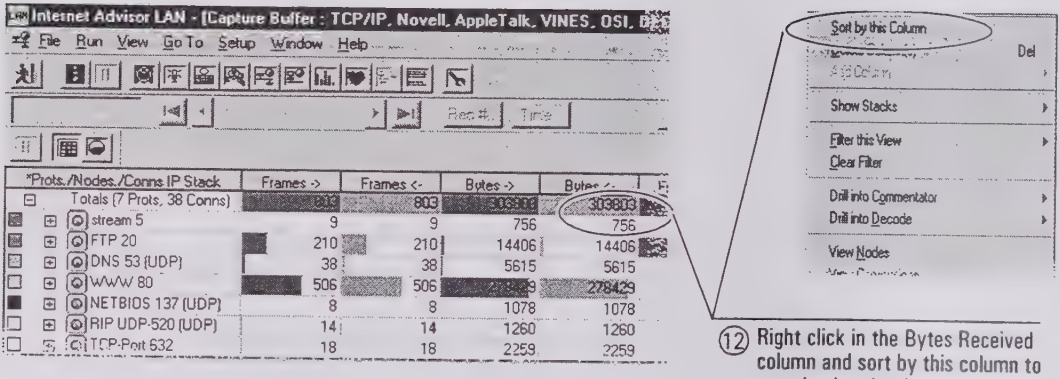
Step 9 drills down to this Connection Statistics measurement view. The Connection Statistics view displays a pie graph and spreadsheet of the connections by default.


Internet Advisor LAN - [Capture Buffer : TCP/IP, Novell, AppleTal
File Run View Go To Setup Window Help
Frames ->
10.17.160.135 <-> All IP Stations FTP 20
30 Others
10.17.161.31 <-> All IP Stations FTP 20
209.38.71.209 <-> www.nagano.olympic.org WWW 80
209.38.71.209 <-> www.nagano.olympic.org WWW 80
209.38.71.209 <-> www.nagano.olympic.org WWW 80
*Connections IP Stack
Frames ->
Totals (38 Conns)
10.17.160.135 <-> All IP Stations FTP 20
10.17.161.31 <-> 10.17.160.65 FTP 20

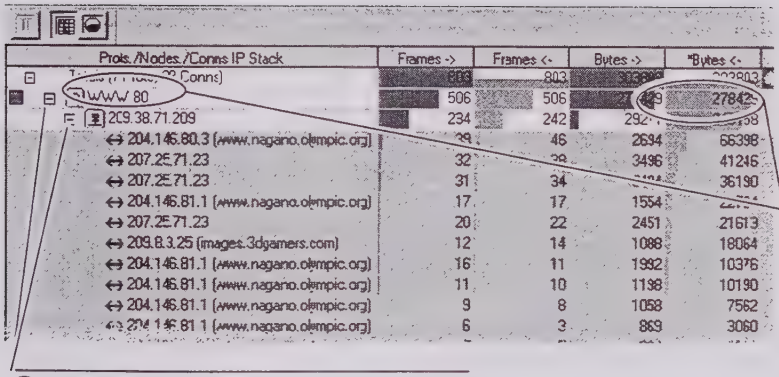
⑩ **Remove the pie graph to focus on the spreadsheet.**



⑪ Change the view to show which protocols, which nodes, and which connections are using the most bandwidth.



⑫ Right click in the Bytes Received column and sort by this column to sort the data by the protocol with the most bytes received.



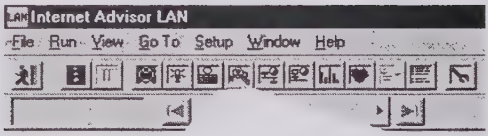
(13) **Notice that protocol WWW 80 has the highest Bytes Received traffic.**

(14) **Expand the WWW 80 protocol and the IP address 209.38.71.209.**

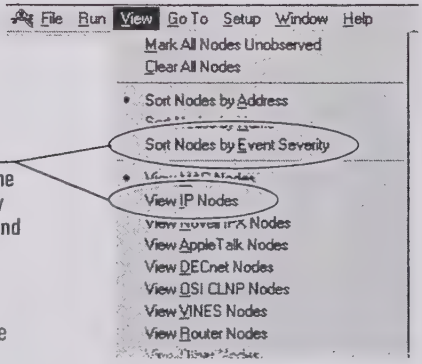
Notice 209.38.71.209 is connected to several addresses, including www.nagano.olympic.org.

Conclusions:

- Station 209.38.71.209 is using the Internet.
- It is connecting to servers in Nagano, Japan.
- During this measurement, station 209.38.71.209 has received a large amount of data.
- Protocol WWW 80 is being used in the heaviest traffic connection.



⑮ **Open the Node Discovery measurement to identify whether this connection produced any of the Alert or Warning counts displayed in the Expert Analyzer measurement.**

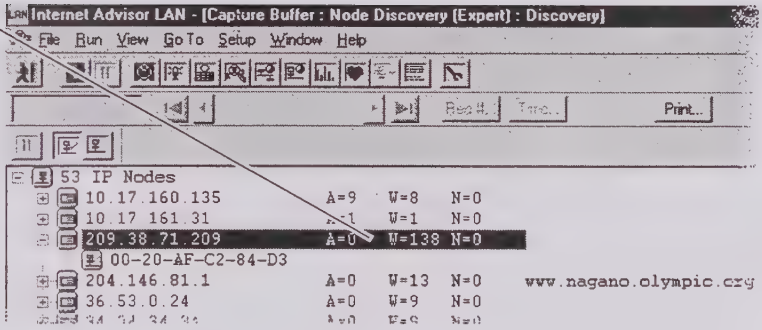


⑯ **Use the View menu to show the nodes sorted by event severity (Alert, Warning, and Normal) and to view the nodes by their IP protocol address.**

You can also display these selections by right clicking on the node list.

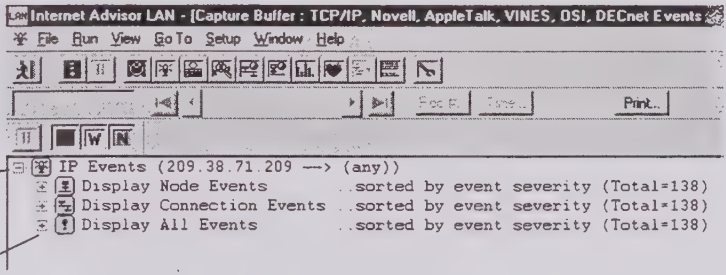
Notice node 209.38.71.209 has the most Warnings.

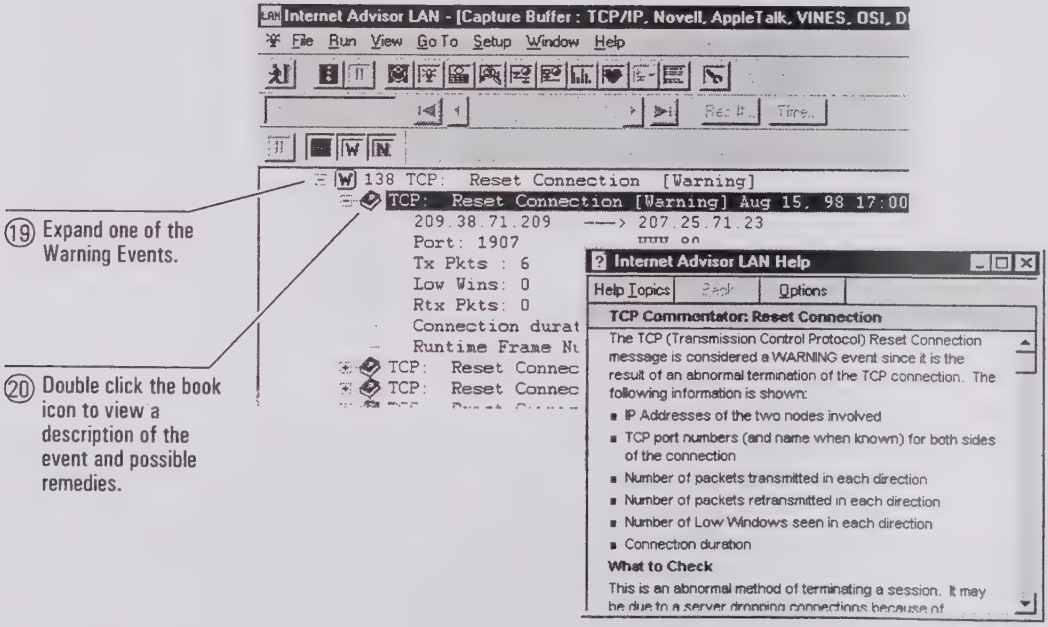
⑰ **Double click the 209.38.71.209 IP address to open the Commentator measurement with filtering on the selected address and display the Warning events.**


Internet Advisor LAN - [Capture Buffer : Node Discovery (Expert) : Discovery]
File Run View GoTo Setup Window Help
Print...
53 IP Nodes
10.17.160.135 A=9 W=8 N=0
10.17.161.31 A=1 W=1 N=0
209.38.71.209 A=0 W=138 N=0
00-20-AF-C2-84-D3
204.146.81.1 A=0 W=13 N=0 www.nagano.olympic.org
36.53.0.24 A=0 W=9 N=0

Notice the Commentator view is filtered on the address you drilled from in the Node Discovery measurement.

⑱ **Expand the Display All Events branch.**


Internet Advisor LAN - [Capture Buffer : TCP/IP, Novell, AppleTalk, VINES, OSI, DECnet Events
File Run View GoTo Setup Window Help
Print...
IP Events (209.38.71.209 --> (any))
Display Node Events ..sorted by event severity (Total=138)
Display Connection Events ..sorted by event severity (Total=138)
Display All Events ..sorted by event severity (Total=138)


Internet Advisor LAN - [Capture Buffer : TCP/IP, Novell, AppleTalk, VINES, OSI, D
File Run View Go To Setup Window Help
138 TCP: Reset Connection [Warning]
TCP: Reset Connection [Warning] Aug 15, 98 17:00
209.38.71.209 ---> 207.25.71.23
Port: 1907
Tx Pkts : 6
Low Wins: 0
Rtx Pkts: 0
Connection durat
Runtime Frame Nu
TCP: Reset Connec
TCP: Reset Connec
19 Expand one of the Warning Events.
20 Double click the book icon to view a description of the event and possible remedies.
Internet Advisor LAN Help
Help Topics
Back
Options
TCP Commentator: Reset Connection
The TCP (Transmission Control Protocol) Reset Connection message is considered a WARNING event since it is the result of an abnormal termination of the TCP connection. The following information is shown:
IP Addresses of the two nodes involved
TCP port numbers (and name when known) for both sides of the connection
Number of packets transmitted in each direction
Number of packets retransmitted in each direction
Number of Low Windows seen in each direction
Connection duration
What to Check
This is an abnormal method of terminating a session. It may be due to a server dropping connections because of

Conclusions:

2 Excessive Reset Connection events occurring for this IP address can slow the network response time.

Tracing a Conversation Between Two Ethernet Stations

You know messages are occurring between two stations. You want to see the actual frames being exchanged so you can view the frame details. Things you want to know may include:

- what ports or sockets are being used
- what frame sizes are occurring
- what are the field values in the frame header

Example equipment

The Internet Advisor LAN used in this example has the standard Ethernet interface. You can use this interface or you can also use a Fast Ethernet interface for Internet Advisor LAN.

About filtering

To use filtering, you have to know some information about the traffic you want a filter to match. From the example test, Troubleshooting a Slow Network, you know the IP address of a station on your network that is responsible for a large amount of Internet traffic from the Olympic site at Nagano, Japan. The TCP WWW 80 port (well-known port #80) is used for http traffic on the Internet.

Capture filters control what frames are saved in the capture buffer. You can use display filters to view only selected frames already in the capture buffer. Display filtering does not affect the frames in the capture buffer, it only controls what frames are displayed.

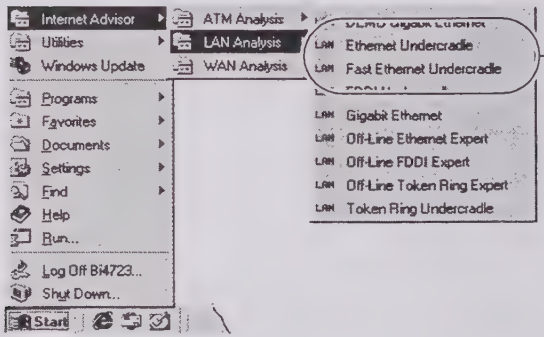
You can filter on protocol characteristics such as a protocol suite. You can filter on specific packet types or messages within a protocol suite. You can filter on station addresses for frames going to or from a particular address. You can filter on frames between two specific station addresses.

For example, if you are looking for frames occurring on the Internet, you would check to see if the TCP WWW 80 port is being used by any station.

This example uses the same data file as the Troubleshooting a Slow Network example. Since this example test is using a data file, only display filtering is demonstrated. The same filter concepts apply for capture filtering and search filtering.

① **Start the Internet Advisor LAN application.**

If you are continuing from the previous sample test, you need to exit the application and restart it again to exactly repeat this sample test.



The Ethernet and Fast Ethernet hardware on your Internet Advisor displays in this cascaded menu.

② **If you are going to use the Demo_1.dat file and follow this example on your own Internet Advisor, load the file now.**

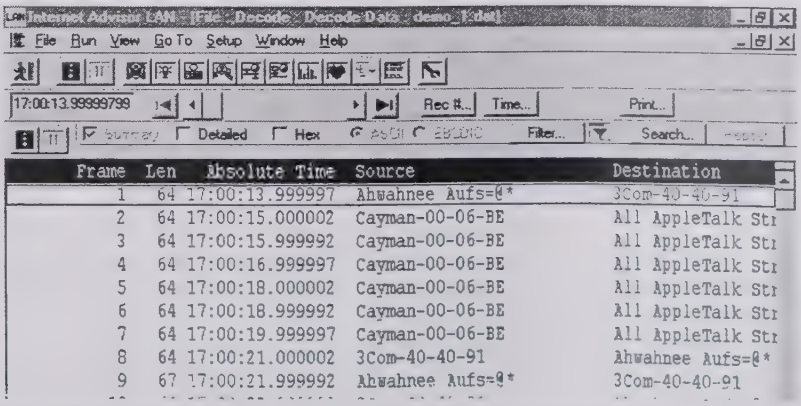
a. Use File | Open (Load Data) and the path:C:\ADVISOR\LAN\DATA\DEMO_1.DAT.

b. Click OK.

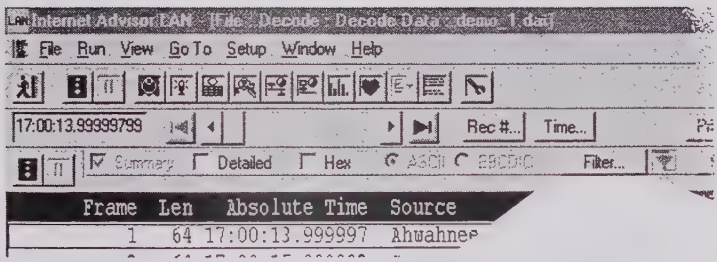
c. The Internet Advisor loads the file into the capture buffer and automatically opens the Decode measurement to display the file. This takes several seconds, depending on the type of Internet Advisor you have.

The Decode measurement displays all frames in the sequence they were captured in the data file.

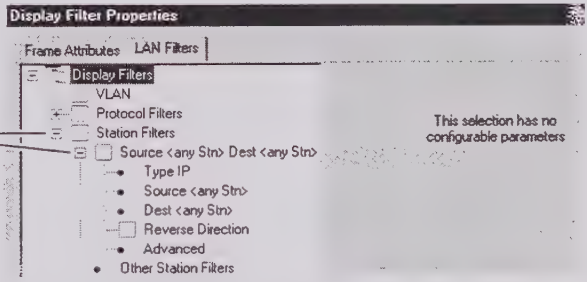
All source and destination addresses display.



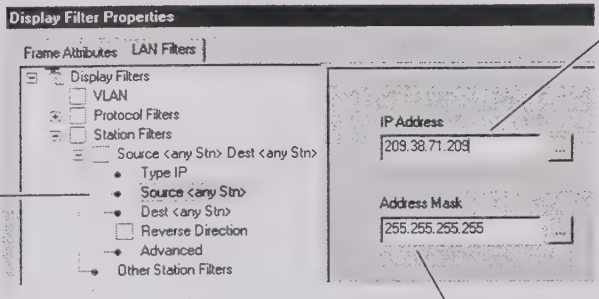
Frame	Len	Absolute Time	Source	Destination
1	64	17:00:13.999997	Ahwahnee Aufs=0*	3Com-40-40-91
2	64	17:00:15.000002	Cayman-00-06-BE	All AppleTalk Str
3	64	17:00:15.999992	Cayman-00-06-BE	All AppleTalk Str
4	64	17:00:16.999997	Cayman-00-06-BE	All AppleTalk Str
5	64	17:00:18.000002	Cayman-00-06-BE	All AppleTalk Str
6	64	17:00:18.999992	Cayman-00-06-BE	All AppleTalk Str
7	64	17:00:19.999997	Cayman-00-06-BE	All AppleTalk Str
8	64	17:00:21.000002	3Com-40-40-91	Ahwahnee Aufs=0*
9	67	17:00:21.999992	Ahwahnee Aufs=0*	3Com-40-40-91



③ **Select the Filter button to open the dialog for specifying a display filter.**



④ **Expand the Station Filters branch and then expand the Source branch to access the filter parameters.**



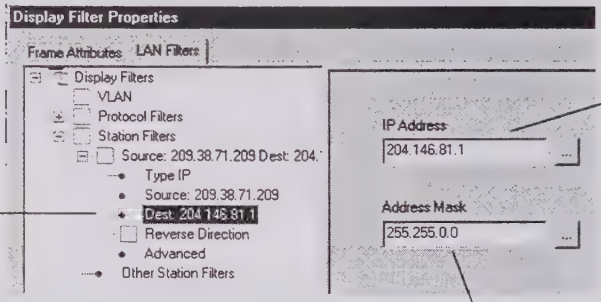
⑤ **Choose the Source line to open the advanced filter pane on the right.**

⑥ **Enter/type the IP Address, 209.38.71.209.**

This is the address of the local node whose traffic you want to view.

⑦ **Leave 255.255.255.255 in the Address Mask field.**

This mask will compare against all bits in the IP address field.



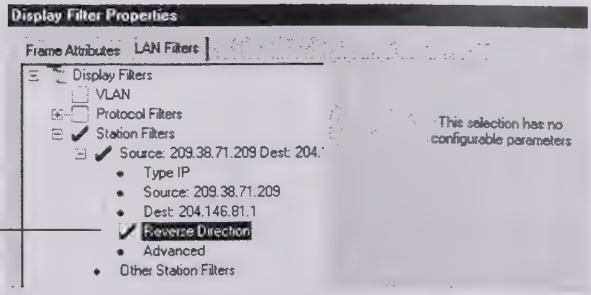
(8) **Select the Dest line to open the advanced filter pane on the right.**

(9) **Type the IP address 204.146.81.1.**

This is the IP address of one of the Olympics servers.

(10) **Type 255.255.0.0 in the Address Mask field.**

This mask will compare against the 204.146 network and subnet portion of the IP address above. The .0.0 portions of the mask are "don't cares" which means that any subnet and station address in those positions will be accepted.



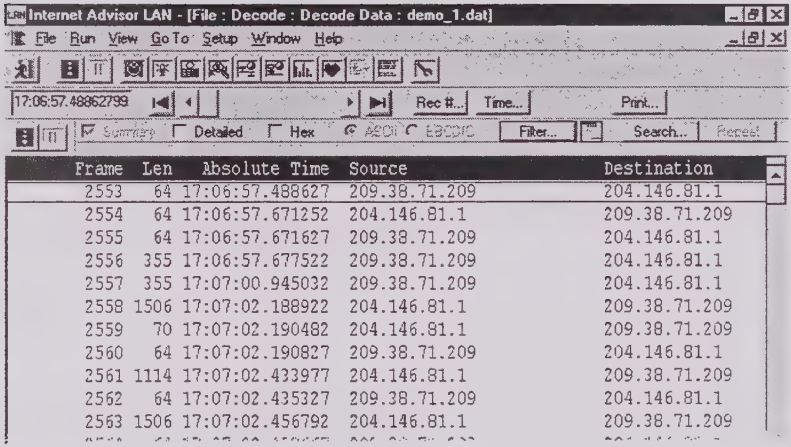
(11) **Select the Reverse Direction line.**

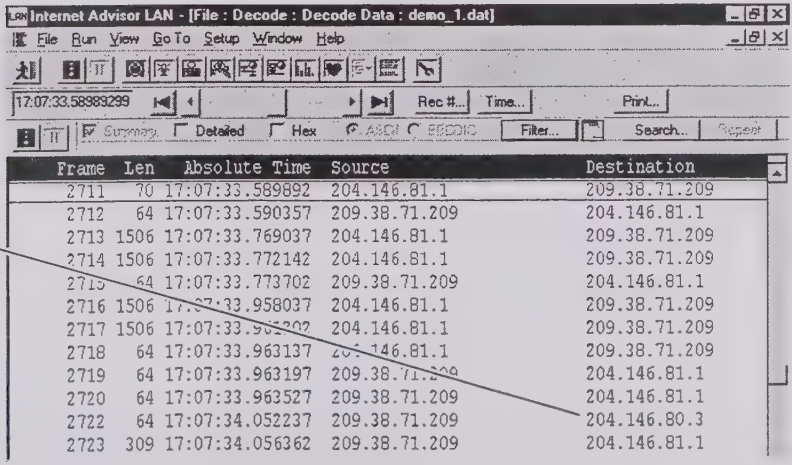
This makes the filter look for frames going
From 209.38.71.209 To 204.146.X.X
AND
From 204.146.X.X to 209.38.71.209.

Selecting the Reverse Direction line also enables (checkmark) the Station Filters branch of the Display Filter.

(12) **Click OK to accept the Display Filter filter definition.**

The Decode view now shows only frames with Source and Destination addresses that match the filter.

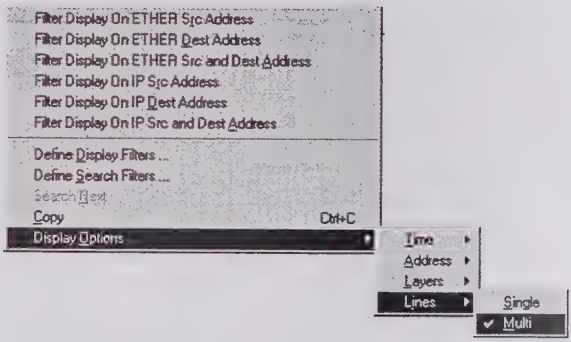




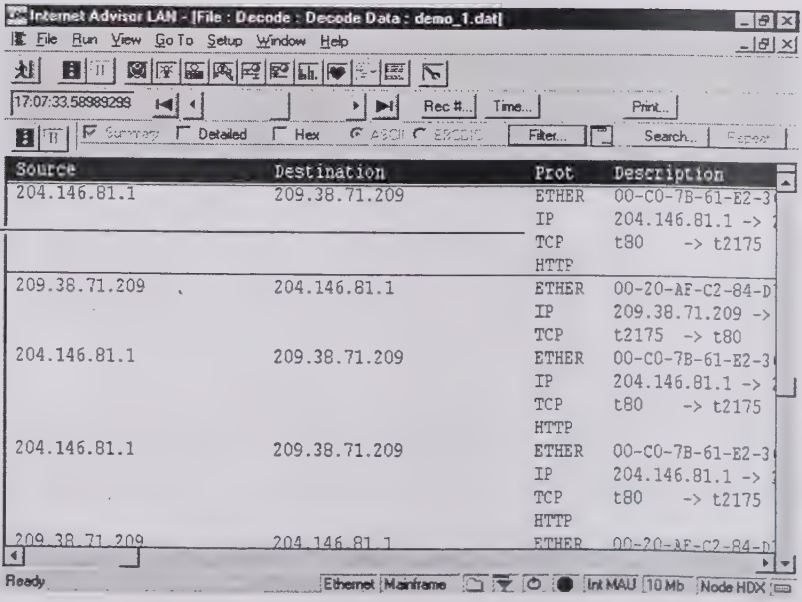
(13) **Use the PgDn key to scroll the list until you see the IP address 204.146.80.3.**

The Address Mask used in step 10 displays all Nagano server addresses at 204.146.x.x.

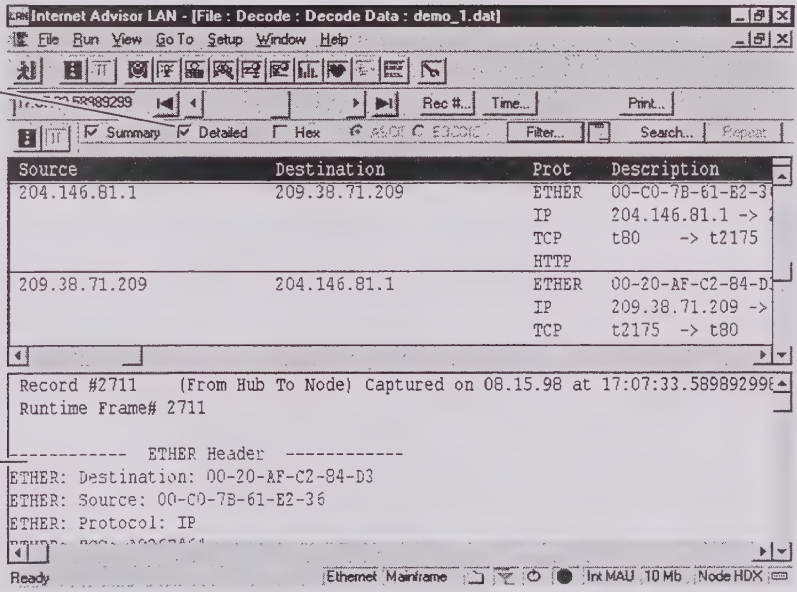
⑭ Right click the mouse anywhere in the Decode view and select Display Options | Lines | Multi.



⑮ Notice that the protocols used in each frame are now more easily viewed.



⑯ Display the Detailed measurement view.


Internet Advisor LAN - [File : Decode : Decode Data : demo_1.dat]
File Run View GoTo Setup Window Help
Rec #... Time... Print...
Summary Detailed Hex Filter... Search... Repeat
Source Destination Prot Description
204.146.81.1 209.38.71.209 ETHER 00-C0-7B-61-E2-3
IP 204.146.81.1 ->
TCP t80 -> t2175
HTTP
209.38.71.209 204.146.81.1 ETHER 00-20-AF-C2-84-D
IP 209.38.71.209 ->
TCP t2175 -> t80
Record #2711 (From Hub To Node) Captured on 08.15.98 at 17:07:33.
Runtime Frame# 2711
---------- ETHER Header ----------
ETHER: Destination: 00-20-AF-C2-84-D3
ETHER: Source: 00-C0-7B-61-E2-36
ETHER: Protocol: IP
Ready
Ethernet Mainframe Int MAU 10 Mb Node HDX

This view shows the contents of each field in the frame highlighted in the Summary view.

Conclusion:

- By using a display filter, you can view only the frames in the capture buffer that are of interest to you.
- You can filter on source and/or destination addresses.
- By using an address mask, you can filter on an entire IP address or only on portions of the IP address.

Export to CSV

You can save the Internet Advisor LAN measurement data to a Comma Separated Values (CSV) format file.

Then, you can import this CSV file directly into a spreadsheet (Excel or Lotus 1-2-3), or easily process the file with a text processing program written in a programming language such as Pearl, AWK, Basic, or C. This gives the capability of generating statistics or graphs that are not shown in the Advisor.

Example equipment

The Internet Advisor used in this example has the Ethernet interface. You can also use a Fast Ethernet, FDDI, or Token-Ring interface.

About exporting in CSV format

In this sample test, we are using data captured from a network. You can export to CSV from the following Internet Advisor LAN measurements:

Expert AnalyzerProtocol Statistics

CommentatorMAC Node Statistics

Connection StatisticsProtocol Vitals

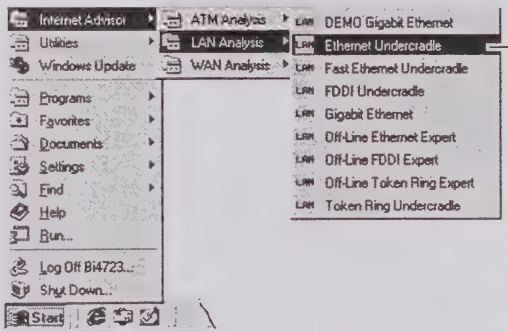
Line Vitals

① **Connect to a network.**

See chapter 2 for information about connecting the Internet Advisor to your network.

② **Start the Internet Advisor LAN application.**

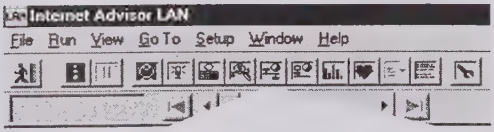
Choose the LAN interface menu item appropriate for your system.



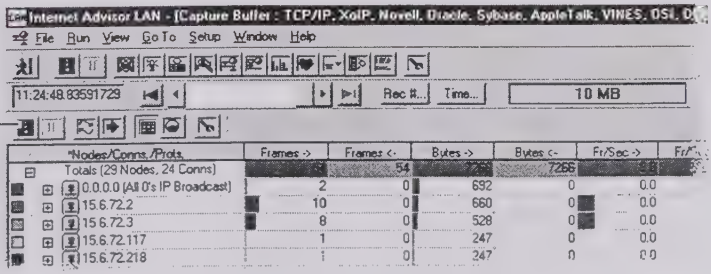
The Ethernet undercradle is selected in this sample test.

③ **Select a measurement.**

In this sample test, Connection Stats is selected.



④ **Use the Start / Stop button to capture some frames and then stop the measurement.**

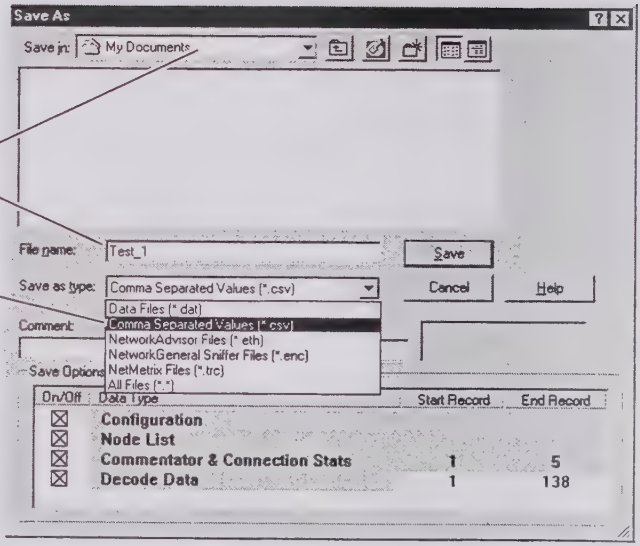


⑤ Select the File | Save (Data) menu item.

⑥ Select a path and file name.

⑦ Select .CSV as the file type.
Use "Comma Separated Values (*.csv)".

⑧ Select the Save button.



Tip:
In the Internet Advisor LAN application's online Help, see "CSV export format" in the index for a description of the CSV file format.

Import CSV Into a Spreadsheet

You can import Internet Advisor LAN measurement data saved as a .CSV file into a spreadsheet (Excel or Lotus 1-2-3).

You can also process the file with a text processing program written in a programming language such as Pearl, AWK, Basic, or C. This gives the capability of generating statistics or graphs that are not shown in the Advisor.

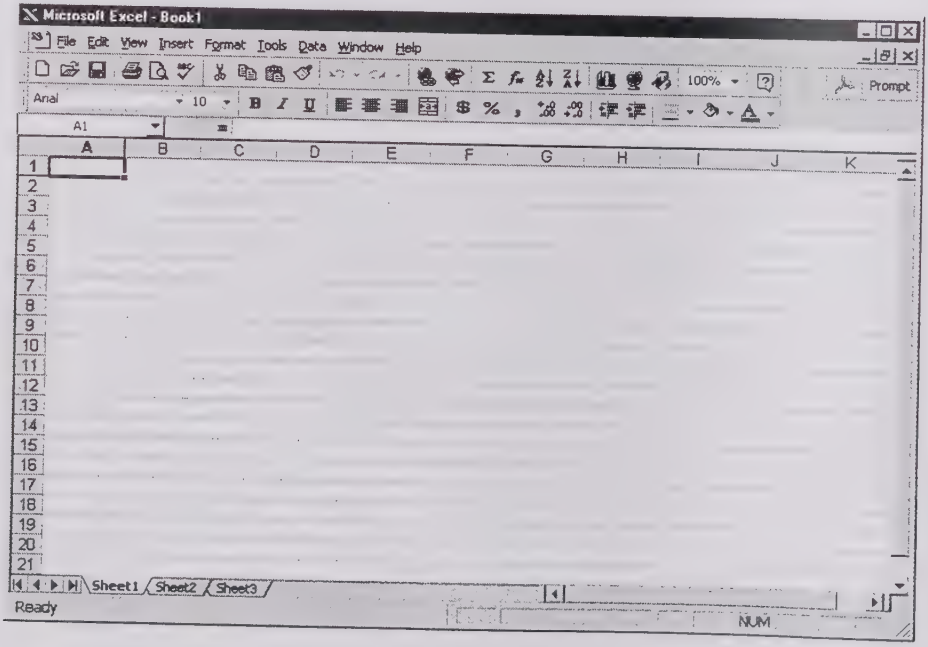
About importing CSV format

In this sample test, we are using data captured from a network and saved to a CSV file.

This example uses the Microsoft Excel spreadsheet to import an Advisor data file saved in CSV format.

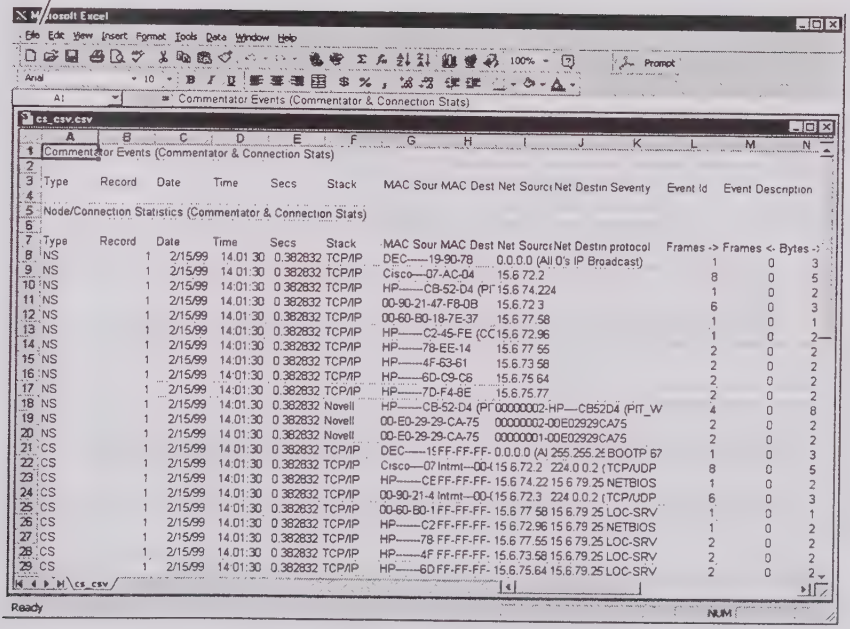
(1) See the previous sample test to see how to save Internet Advisor LAN measurement data to a .CSV file.

(2) Start the Excel application.


Microsoft Excel - Book1
File Edit View Insert Format Tools Data Window Help
Arial
10
100%
Prompt
A1
A B C D E F G H I J K
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Sheet1 Sheet2 Sheet3
Ready
NUM

(3) Select the File | Open menu item and then use the Browse feature to find and open your .CSV file.

(4) Scroll the display to see data stored in each sample interval record.


Microsoft Excel
File Edit View Insert Format Tools Data Window Help
Commentator Events (Commentator & Connection Stats)
cs_csv.csv
Commentator Events (Commentator & Connection Stats)
Node/Connection Statistics (Commentator & Connection Stats)
Ready
NUM

Tip:
In the Internet Advisor LAN application's online Help, see "CSV export format" in the index for a description of the CSV file format.

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